

WHAT IS CLAIMED IS:

- 1 1. A regulator circuit comprising:
2 a circuit control node;
3 a circuit output node to which a load can be connected, a voltage at said circuit
4 output node being determined based on a voltage signal at said circuit control node;
5 an amplifier circuit having a first amplifier input and a second amplifier input,
6 and further having an amplifier output, said first amplifier input configured for receiving a
7 reference voltage, said amplifier circuit receiving power from a first voltage source;
8 a source follower circuit having a source follower input node and a source
9 follower output, said amplifier output configured drive said source follower input node, said
10 source follower output coupled to said circuit control node; and
11 a feedback circuit coupled between said circuit output node and said second
12 amplifier input.
- 1 2. The circuit of claim 1 further comprising a current mirror circuit
2 coupled between said amplifier output and said source follower.
- 1 3. The circuit of claim 2 further comprising a resistor component coupled
2 between a second voltage source and said source follower input node.
- 1 4. The circuit of claim 3 wherein said first voltage source is substantially
2 the same potential as the second voltage source.
- 1 5. The circuit of claim 3 wherein said first voltage source is different
2 from the second voltage source.
- 1 6. The circuit of claim 1 wherein said source follower circuit comprises a
2 transistor element in series connection with a current source.
- 1 7. The circuit of claim 1 wherein said amplifier circuit comprises a single
2 op amp component.
- 1 8. The circuit of claim 1 wherein said amplifier circuit comprises two or
2 more op amp components.

1 9. The circuit of claim 1 wherein said feedback path comprises a pair of
2 resistor components configured as a voltage divider.

1 10. The circuit of claim 1 wherein a pass element having a control node an
2 can be connected to said circuit control node, wherein a output node of said pass element can
3 be connected to said circuit output node, whereby said pass element can provide a regulated
4 output voltage at its output node to a load connected thereto.

1 11. The circuit of claim 10 wherein a second voltage source different from
2 said first voltage source can be connected to said load via said pass element, thereby
3 providing a voltage to said load that is independent of said first voltage source.

1 12. A circuit comprising:
2 a first circuit node;
3 a second circuit node, wherein a voltage level thereat varies in accordance
4 with a voltage level of said first circuit node;
5 an error amplifier having a first amplifier input configured to be coupled to a
6 reference voltage, having a second amplifier input, and having an amplifier output, said error
7 amplifier configured to receive power from a first voltage source;
8 a gain stage comprising a source follower circuit in electrical communication
9 with said amplifier output and with said first circuit node;
10 a feedback path coupled between said second node and said second circuit
11 amplifier input, said feedback path including a pair of resistors configured as a voltage
12 divider.

1 13. The circuit of claim 12 wherein said gain stage comprises a first
2 transistor component in series with a current source and having a control terminal, said
3 amplifier output configured to drive said control terminal.

1 14. The circuit of claim 13 further comprising a resistor component
2 coupled between a second voltage source and said control terminal.

1 15. The circuit of claim 13 further comprising a current mirror coupled
2 between said amplifier output and said gain stage.

1 16. The circuit of claim 15 wherein said current mirror comprises a second
2 transistor component and a third transistor component, each having a control node connected
3 to said amplifier output, each having a first terminal at ground potential, said second
4 transistor component having a second terminal connected to said first node, said third
5 transistor component having a second terminal connected to said control node of said first
6 transistor component.

1 17. The circuit of claim 16 further comprising a resistor component
2 coupled between a second voltage source and said control terminal of said first transistor
3 component.

1 18. The circuit of claim 14 wherein said first voltage source and said
2 second voltage source are substantially of equal DC (direct current) voltage levels.

1 19. The circuit of claim 14 wherein said first voltage source and said
2 second voltage source have different DC voltage levels.

1 20. The circuit of claim 12 wherein said second circuit node provides a
2 feedback voltage that varies with a voltage across an external load that is coupled thereto.

1 21. The circuit of claim 12 wherein a pass element having a control node
2 an can be connected to said first circuit node, wherein a output node of said pass element can
3 be connected to said second circuit node, whereby said pass element can provide a regulated
4 output voltage at its output node to a load connected thereto.

1 22. The circuit of claim 21 wherein a second voltage source different from
2 said first voltage source can be connected to said load via said pass element, thereby
3 providing a voltage to said load that is independent of said first voltage source.

1 23. A method for regulating an output voltage level of a circuit output
2 node of a circuit comprising:
3 detecting said output voltage level;
4 producing an error signal based on a comparison of said output voltage level
5 relative to a reference voltage;
6 controlling a source follower circuit with said error signal to produce a source
7 follower output; and

8 varying said output voltage level based on said source follower output,
9 wherein a bandwidth at said output node has a pole at a frequency greater than
10 the unity gain frequency of said circuit.

1 24. The method of claim 23 further comprising setting a DC operating
2 point of said source follower circuit via a resistor element coupled to a first voltage source.

1 25. The method of claim 24 further comprising controlling a pass circuit
2 with said source follower output to produce said output voltage level.

1 26. The method of claim 25 wherein controlling said pass circuit with
2 includes applying said source follower output to a control node of said pass circuit, said pass
3 circuit being powered by a second voltage source, wherein a pole at said control node of said
4 pass circuit varies with a pole at said circuit output node.

1 27. The method of claim 26 wherein said first voltage level is different
2 from said second voltage level.

1 28. A voltage regulator circuit comprising:
2 first means for detecting said output voltage level;
3 second means for producing an error signal based on a comparison of said
4 output voltage level relative to a reference voltage, said second means couple to a first
5 voltage source; and
6 a source follower circuit in electrical communication with said first means to
7 produce a source follower output,
8 wherein said output voltage level is varied in response to variances in said
9 source follower output,
10 wherein a bandwidth at said output node has a pole at a frequency greater than
11 the unity gain frequency of said circuit.

1 29. The circuit of claim 28 wherein said source follower output can be
2 connected to a pass element that is connected to a second voltage source, wherein an output
3 of said pass element constitutes said output voltage.

1 30. The circuit of claim 28 further comprising a resistor component
2 connected between said first voltage source and said source follower circuit.